

## Government Estimate Total Costs

### Option 3-- Cost Estimate Summary for 85% Wet Removal & 15% Dry Removal Slurry Pipe & Rail to Bandmann Flats Scenario without Drop Structures

#### Area I Sediment/Dam Removal Alternative Milltown Reservoir Site

Site: MRSS Location: Milltown, Montana Phase: Feasibility Study (-30% to +50%) Base Year: 2002 Date: December 25, 2002		Description: Dam Removal and Partial Sediment Removal Sediment Disposal to Repository Located at Bandmann Flats			
Construction Item		Quantity	Unit	Unit Cost	Total Cost
<b>PHASE I</b>					
<b>1</b>	<b>Design Phase</b>				
1.1	Remedial Design	4	%	\$ 83,226,095	\$ 3,329,044
1.2	Permits	1	%	\$ 83,226,095	\$ 832,261
1.3	Repository Footprint Plus Buffer Land Acquisition	69.5	Acres	\$ 10,000	\$ 695,000
1.4	Staging Area and Slurry Pipeline Right of Way (temporary easement) Agreement	15.2	Acres	\$ 1,200	\$ 18,240
1.5	Construction Contracting	1	%	\$ 83,226,095	\$ 832,261
	Subtotal				\$ 5,706,806
	Contingency	15	%	\$ 5,706,806	\$ 856,021
	<b>Phase I Total</b>				<b>\$ 6,562,827</b>
<b>PHASE II</b>					
<b>2</b>	<b>Site Preparation</b>				
2.1	Mobilization	1	LS	\$ 125,492	\$ 125,492
2.2	Setup Site Security, Surveying/Staking	1	LS	\$ 131,334	\$ 131,334
2.3	Improve Access From Deer Creek Road to Bandmann Repository Area	1,500	LF	\$ 28.53	\$ 42,795
2.4	Improve Access From Frontage Road to Rodeo Grounds Staging Area	1,500	LF	\$ 28.53	\$ 42,795
2.5	Clear & Grub				
2.5.1	Staging Area and Slurry Pipeline Route	15.2	Acres	\$ 1,876.7	\$ 28,526
2.5.2	Reservoir Removal Area	86	Acres	\$ 1,876.7	\$ 161,396
2.5.3	Primary Haul Road Route/Rail Loading and Unloading Spurs	17.5	Acres	\$ 1,876.7	\$ 32,842
2.5.4	Repository Footprint	69.5	Acres	\$ 1,876.7	\$ 130,431

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<b>3</b>	<b>Repository and Slurry Pipeline Construction</b>				
3.1.	Slurry Line from Area I to Repository/Haul Road From Area I to Rail Spur				
3.1.1	Dry Conditions Primary Haul Road Construction/Improvement	600	LF		
3.1.1.1	Cut/Fill Along Road Alignment	NA	CY	\$ -	
3.1.1.2	Gravel Road Surface Placement	444	CY	\$ 23.06	\$ 10,239
3.1.1.3	Safety Berms	356	CY	\$ 14.57	\$ 5,187
3.1.2.	Install Slurry Line from Tech Tanks to Bandmann Repository				
3.1.2.1	Purchase and Install Pipeline	7,143	LF	\$ 62.89	\$ 449,223
3.1.2.2	Construct Booster Station(s)	1	EA	\$ 30,254.81	\$ 30,255
3.1.4	Sheetpile Access Road Construction and Removal	6,100	LF	\$ 106.70	\$ 650,870
3.1.4.1	Purchase and Place Geofabric (wet areas only)	29,822	SY	\$ 2.46	
3.1.4.2	Place Base Material (2 Feet Thick, Wet Areas Only)	18,074	CY	\$ 22.53	
3.1.4.3	Gravel Road Surface Placement	2,711	CY	\$ 43.37	
3.1.4.4	Safety Berms	3,620	CY	\$ 14.57	
3.1.4.10	Remove Sheetpile Access Road	24,405	CY	\$ -	
3.2	Bandmann Repository Construction				
3.2.-1	Relocate Deer Creek Road	3,236	LF	\$ 35.11	\$ 113,616
3.2.-2	Wet Repository				
3.2.-2.1	Excavate Topsoil From Repository Footprint to Obtain and Stockpile Capping Material	146,491	CY	\$ 3.21	\$ 470,236
3.2.-2.2	Excavate Repository Cells/Construct Repository Outer Berms	1,256,485	CY	\$ 3.41	\$ 4,284,614
3.2.-2.2.1	Bottom Liner System Purchase and Placement				
3.2.-2.2.1.1	Bedding	226,512	SY	\$ 3.31	\$ 749,755
3.2.-2.2.1.2	HDPE Liner	226,512	SY	\$ 4.93	\$ 1,116,704
3.2.-2.2.1.3	Geofabric Above Liner	226,512	SY	\$ 2.46	\$ 557,220
3.2.-2.3	Leachate Collection/Bottom Drainage System Installation				
3.2.-2.3.1	Drain Rock	75,504	CY	\$ 21.66	\$ 1,635,417
3.2.-2.3.2	Filter Fabric	226,512	SY	\$ 1.39	\$ 314,852
3.2.-2.3.3	Sumps	10	EA	\$ 2,732.81	\$ 27,328
3.2.2	Construct Settling Pond (assumed not required)	0	LS	\$ -	\$ -
3.2.3	Install Monitoring Wells	10	EA	\$ 7,391.95	\$ 73,920
3.3	Reservoir Rail Spur/Loading Infrastructure	1	LS	\$ 533,445.00	\$ 533,445
3.4	Bandmann Flats Rail Spur/Unloading Infrastructure	1	LS	\$ 332,107.00	\$ 332,107

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Construction Item		Quantity	Unit	Unit Cost	Total Cost
<b>4</b>	<b>Sediment Removal Area I Isolation</b>				
4.1	Install Turbidity Control Measures	61,000	SF	\$ 7.37	\$ 449,570
4.2	Install Sheetpiling (Includes Mob and Sheetpile wall)				
4.2.1	Linear Section Pile Driving	231,800	SF	\$ 35.15	\$ 8,147,770
4.2.2	Cell Section Pile Driving	0	SF	\$ -	\$ -
4.2.3	Buttressing/Cofferdam	1	LS	\$ 3,735,651.00	\$ 3,735,651
	Subtotal				\$ 24,383,587
	Contingency	15	%	\$ 24,383,587	\$ 3,657,538
	<b>Phase II Total</b>				<b>\$ 28,041,126</b>

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Construction Item		Quantity	Unit	Unit Cost	Total Cost
<b>PHASE III</b>					
<b>5</b>	<b>Sediment Excavation</b>				
5.1	Install Dewatering System				
5.1.1	Purchase/Place Tech Tanks	3	EA	\$ 475,782	\$ 1,427,347
5.1.2	Install Slurry and Return Water Pipelines				
5.1.2.1	Install Slurry Line (covered under WBS 5.3.2)	5,000	LF	\$ -	
5.1.2.2	Install Return Line				
5.1.2.2.1	Shore Pipeline	175	LF	\$ 77.98	\$ 13,647
5.1.2.2.2	Submerged Pipeline	325	LF	\$ 67.95	\$ 22,084
5.1.3	Open Radial Gate and/or Convert Powerhouse Intakes to Low Level Outlets	1	LS	\$ 145,000.00	\$ 145,000
5.2	Mechanical Excavation of Top Layer and Haul to Bandmann Repository (15% of Sediments)	1	LS	\$ 4,311,089.00	
5.2.1	Mobilization/Setup	1	LS	\$ 87,930.00	\$ 87,930
5.2.2	Construction of Secondary Haul Roads/Dragline Work Pads/Dewatering Benches	11,000	LF		
5.2.2.1	Purchase and Place Geofabric (Wet Areas Only)	83,000	SY	\$ 2.46	\$ 204,180
5.2.2.2	Place Base Material (2 Feet Thick, Wet Areas Only)	52,000	CY	\$ 19.85	\$ 1,032,200
5.2.2.3	Gravel Surface Placement	8,000	CY	\$ 38.44	\$ 307,520
5.2.2.4	Safety Berms	6,500	CY	\$ 14.57	\$ 94,705
5.2.3	Dewater Excavation Area Through Pumping or Dredging (separately costed only when not hydraulic dredging)	6	Month	\$ 45,788.50	\$ 274,731
5.2.4	Water Management at Tech Tanks/Discharge to River or Return Water to Hydraulic Excavation	8,242,560	GAL	\$ 0.0003	\$ 2,583
5.2.5	Mechanical Excavation of Sediments (also includes excavation of material placed to construct sheetpile & secondary haul roads)	442,000	CY	\$ 2.99	\$ 1,321,580
5.2.6	Excavated Material Placement/Manipulation on Bench to Assist Dewatering	442,000	CY	\$ 1.80	\$ 795,600
5.2.7	Load Excavated Material on to Haul Trucks	442,000	CY	\$ 0.43	\$ 190,060
5.3	Hydraulic Excavation (85% of Sediments)				
5.3.1	Mobilization/Setup	1	LS	\$ 296,083	\$ 296,083
5.3.2	Primary Dredging From Excavation to Tech Tanks	2,208,000	CY	\$ 7.38	\$ 16,295,040
5.3.3	Initial Dewatering at Tech Tanks/Return Water to Excavation	1,918,620,000	GAL	\$ 0.0003	\$ 598,581
5.3.4	Oversized Material/Debris Removed/Stockpiled for Truck Haul to Repository	NA	CY	\$ -	
5.3.5	Secondary Dredging at Tech Tanks	2,208,000	CY	\$ 2.01	\$ 4,438,080
5.4	Annual Shutdown/Winterization/Re-Setup	3	YR	\$ 202,708	\$ 608,125
5.5	Final Demobilization of Excavation/Dewatering Equipment (covered in mobilization unit cost)	1	LS	\$ 233,156	\$ 233,156

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Construction Item		Quantity	Unit	Unit Cost	Total Cost
<b>6</b>	<b>Sediment Transport</b>				
6.1	Haul Dry Material to Rail Loading Spur (Truck)	442,000	CY	\$ 2.80	\$ 1,237,600
6.2	Haul Road Maintenance (Primary and Secondary Roads)	11,600	LF	\$ 28.81	\$ 334,196
6.3	Load Dry Material Into Train Cars	442,000	CY	\$ 0.78	\$ 344,760
6.4	Rail Transport to Bandmann Flats	442,000	LCY	\$ 1.96	\$ 866,320
6.5	Unload Material at Bandmann Flats	442,000	CY	\$ 0.59	\$ 260,780
6.6	Transport Wet Material to Bandmann Repository via Slurry Piping	2,208,000	CY	\$ 0.71	\$ 1,567,680
6.7	Slurry Pipeline Maintenance (Primary Pipeline)	7,143	LF	\$ 0.76	\$ 5,429
6.8	Slurry Pipe Line Annual Shutdown/Winterization	1	LS	\$ 8,449.77	\$ 8,450
<b>7</b>	<b>Sediment Placement</b>				
7.1	Dry Repository Material Placement/Spreading/Compaction at Bandmann Flats Repository	442,000	CY	\$ 2.46	\$ 1,087,320
7.2	Wet Repository Material at Bandmann Flats Repository				
7.2.1	Slurry Placement and Dewatering				
7.2.1.1	Construct/Raise Internal Dikes Between Cells (using dry sediment material)	50,302	CY	\$ 2.95	\$ 148,391
7.2.1.2	Slurry and Decant Water Piping and Weir Systems Installation and Maintenance	1	LS	\$ 100,000	\$ 100,000
7.2.1.3	Slurry Placement Alternating Between Decant Cells	2,208,000	CY	\$ 0.08	\$ 176,640
7.3	Water Management/Discharge to River	408,480,387	GAL	\$ 0.0003	\$ 127,436
	Subtotal				\$ 34,653,233
	Phase III Additional Contingency for Potential Dredging for Debris Below 14 Feet				
	Contingency	20	%	\$ 34,653,233	\$ 6,930,647
	<b>Phase III Total</b>				<b>\$ 41,583,879</b>

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Construction Item		Quantity	Unit	Unit Cost	Total Cost
<b>PHASE IV</b>					
<b>8 Repository Closure and Haul Road/Slurry Pipeline Reclamation between Staging Area and Repository</b>					
8.1	Slurry Pipeline Removal/Salvage (assume removal cost covered by salvage)	7,143	LF		
8.2	Haul Road Removal/Reclamation or Conversion to Public Use (assume converted at no cost)	600	LF		
8.3	Reservoir Rail Spur Removal or Conversion to Other Use (assume converted at no cost)	3,600	LF		
8.2	Wet Repository Capping and Revegetation	4,100	LF		
8.2.1	Low Permeability Liner	219,736	SY	\$ 5.03	\$ 1,105,272
8.2.2	2-Foot Soil Cover (Load/Haul From Topsoil Stockpile and Place)	146,491	CY	\$ 4.11	\$ 602,078
8.2.3	Revegetation	336,380	SY	\$ 0.10	\$ 33,638
<b>9 Sediment Removal Area I Site Reclamation</b>					
9.1	Develop Borrow Area (no quantities provided - not estimated)	NA	Acres	\$ -	
9.2	Cut New CFR and BFR Channel Into Alluvium	105,805	CY	\$ 3.32	\$ 351,273
9.3	Grade Control Structure Construction on CFR				
9.3.1	Mobilization/Demobilization and Site Preparation	1	LS	\$ 7,469	\$ 7,469
9.3.2	Buried Grade Control Structure (east wing wall)	132	CY	\$ 92.23	\$ 12,174
9.3.3	Armored Dike Construction Across Old CFR Channel (west wing wall)	450	LF	\$ 704.56	\$ 317,052
9.4	Drop Structure Construction on BFR				
9.4.1	Mobilization/Demobilization and Site Preparation	1	LS	\$ 1,966	\$ 1,966
9.4.2	Buried Grade Control Structure	83	CY	\$ 92.11	\$ 7,645
9.4.3	Armored Dike construction Across Old BFR Channel	350	LF	\$ 407.88	\$ 142,758
9.5	Floodplain Backfill Haul and Placement/Contouring	877,653	CY	\$ 2.71	\$ 2,378,440
9.5.1	Alluvium from Cut Channels	105,805	CY	\$ 0.61	
9.5.2	General fill	616,968	CY	\$ 3.10	
9.5.3	Topsoil/Growth Media	154,880	CY	\$ 2.58	
9.6	Construction/Soft Stabilization of New CFR Channel Streambank	8,000	LF	\$ 129.07	\$ 1,032,560
9.7	Protect/Stabilize I-90 Embankment Toe	661	CY	\$ 65.38	\$ 43,216
9.8	Area I Floodplain Revegetation	64	Acres	\$ 1,123	\$ 71,900
9.9	Hard Stabilization/Armoring New BFR and Combined CFR/BFR Channels for 100-Yr Flows	7,551	CY	\$ 65.40	\$ 493,835
9.10	Sheetpile Removal/CFR and BFR Channel Rerouting Through Excavated Area I	1,555	LF	\$ -	
Subtotal					\$ 6,601,276
Contingency		15	%	\$ 6,601,276	\$ 990,191
<b>Phase IV Total</b>					<b>\$ 7,591,467</b>

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		Government			
	Construction Item	Quantity	Unit	Unit Cost	Total Cost
	PHASE V				
10	Spillway Removal, Channel Stabilization and Area II and III Regrading/Revegetation				
10.1	Dam General Maintenance Until Removed (assumed Montana Power Cost)	7	YR	\$ -	\$ -
10.2	Improve Access to Dam from Both Banks/Construct South Abutment Staging Area	1	LS	\$ 233,331	\$ 233,331
10.3	Convert Powerhouse Inlets to Low Level Outlets (assumed Montana Power cost)	1	LS	\$ -	
10.4	Install Coffor Dams Upstream and Downstream of Spillway/Radial Gate				
10.4.1	Construct Embankments	7,900	CY	\$ 21.37	\$ 168,823
10.4.2	Install Sheetpiling	80	LF	\$ 437.25	\$ 34,980
10.5	Remove Spillway, Radial Gate and Superstructure	1	LS	\$ 1,176,803	\$ 1,176,803
10.5.1	Demolition	25,700	CY	\$ 41.06	
10.5.2	Disposal (on-site burial)	25,700	CY	\$ 4.73	
10.6	Excavate New Channel Upstream of Spillway to Connect to Area I New Channel	94,324	CY	\$ 9.41	\$ 887,589
10.7	Spillway Area Streambank Reconstruction				
10.7.1	Backfill/Regrading	764	CY	\$ 6.60	\$ 5,042
10.7.2	Channel Armoring/Stabilization (including upstream channel reach connecting to Area I)	8,930	CY	\$ 65.40	\$ 584,022
10.8	Remove Coffor Dams				
10.8.1	Remove Sheetpiling	80	LF	\$ -	
10.8.2	Remove Embankments	7,900	CY	\$ 9.27	\$ 73,233
10.9	Close Powerhouse Inlets	1	LS	\$ -	
10.10	Dam Site Reclamation/Revegetation	10	Acres	\$ 1,147	\$ 11,466
10.11	Remaining Sheetpile Removal or Cutoff	4,545	LF	\$ -	
10.12	Final Grading and Revegetation of Sediments Remaining in Areas II and III				
10.12.1	Grading	241,830	CY	\$ 1.32	\$ 319,216
10.12.2	Revegetation	93	Acres	\$ 1,147	\$ 106,631
11	Site Cleanup				
11.1	Staging Area Cleanup	10	Acres	\$ 2,000	\$ 20,000
11.2	Final Demobilization	1	LS	\$ 95,624	\$ 95,624
	Subtotal				\$ 3,716,759
	Contingency	15	%	\$ 3,716,759	\$ 557,514
	Phase V Total				\$ 4,274,273

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Construction Item		Quantity	Unit	Unit Cost	Total Cost
<b>PHASE VI</b>					
<b>12</b>	<b>Ongoing Monitoring/Reporting</b>				
12.1	Completion Reporting	1	LS	\$ 150,000	\$ 150,000
12.2	Groundwater Monitoring	9	YR	\$ 55,000	\$ 495,000
12.3	Surface Water Monitoring	9	YR	\$ 50,000	\$ 450,000
12.4	Biological Monitoring	9	YR	\$ 46,000	\$ 414,000
	Subtotal				\$ 1,509,000
	Contingency	15	%	\$ 1,509,000	\$ 226,350
	<b>Phase VI Total</b>				<b>\$ 1,735,350</b>
	Construction Total				\$ 83,226,095
	Design Total				\$ 6,562,827
<b>13</b>	<b>Project Management</b>				
13.1	Construction Management	9	%	\$ 83,226,094.83	\$ 7,490,349
13.2	Project Management	7	%	\$ 89,788,921.37	\$ 6,285,224
	<b>Total Cost</b>				<b>\$ 103,564,494</b>

### Present Value Analysis

PV Factors from EPA - use 3% Discount and payment at beginning of period.

<b>CONSTRUCTION COSTS (NO CONTINGENCIES)</b>		<b>Government</b>			
<b>Cost Type</b>	<b>Annual Cost</b>	<b>Year</b>	<b>PV Factor</b>	<b>Present Value</b>	
Phase I ( Design Phase)	\$ 5,706,805.69	1	1	\$ 5,706,806	
Phase II (Site Preparation, Repository and Primary Haul Road/Slurry Pipeline Construction, Removal Area Isolation)	\$ 24,383,587.49	2	0.971	\$ 23,676,463	
Phase III (Sediment Excavation, Sediment Transport, Sediment Placement)	\$ 8,663,308.13	3-6	3.609	\$ 31,265,879	
Phase IV (Repository Closure and Primary Haul Road/Slurry Pipeline Reclamation , Removal Area Site Reclamation)	\$ 2,200,425.30	5-7	2.589	\$ 5,696,901	
Phase V (Spillway Removal, Channel Stabilization and Area II and III Regrading/Revegetation, Site Cleanup)	\$ 1,858,379.53	7-8	1.651	\$ 3,068,185	
Phase VI (Ongoing Monitoring/Reporting) and Project Management	\$ 866,024.94	1-9	8.02	\$ 6,945,520	
Construction Management	\$ 936,293.57	2-9	7.02	\$ 6,572,781	
<b>Total Present Value of Alternative</b>					<b>\$ 82,932,535</b>

<b>CONTINGENCIES</b>		<b>Government</b>			
<b>Cost Type</b>	<b>Annual Cost</b>	<b>Year</b>	<b>PV Factor</b>	<b>Present Value</b>	
Phase I (ARCO 15% contingency USACE 15% contingency)	\$ 856,020.85	1	1	\$ 856,021	
Phase II (ARCO 15% contingency USACE 15% contingency)	\$ 3,657,538.12	2	0.971	\$ 3,551,470	
Phase III (ARCO 16.45% contingency USACE 20% contingency)	\$ 1,732,661.63	3-6	3.609	\$ 6,253,176	
Phase IV (ARCO 15% contingency USACE 15% contingency)	\$ 330,063.80	5-7	2.589	\$ 854,535	
Phase V (ARCO 15% contingency USACE 15% contingency)	\$ 278,756.93	7-8	1.651	\$ 460,228	
Phase VI (ARCO 15% contingency USACE 15% contingency)	\$ 25,150.00	1-9	8.02	\$ 201,703	
Construction Management & Project Management (No Contingency applied)		2-9	7.02	\$ -	
<b>Total Present Value of Alternative</b>					<b>\$ 12,177,132</b>

<b>TOTAL COST (CONSTRUCTION + CONTINGENCIES)</b>		<b>Government</b>			
<b>Cost Type</b>	<b>Annual Cost</b>	<b>Year</b>	<b>PV Factor</b>	<b>Present Value</b>	
Phase I ( Design Phase)	\$ 6,562,826.54	1	1	\$ 6,562,827	
Phase II (Site Preparation, Repository and Primary Haul Road/Slurry Pipeline Construction, Removal Area Isolation)	\$ 28,041,125.61	2	0.971	\$ 27,227,933	
Phase III (Sediment Excavation, Sediment Transport, Sediment Placement)	\$ 10,395,969.75	3-6	3.609	\$ 37,519,055	
Phase IV (Repository Closure and Primary Haul Road/Slurry Pipeline Reclamation , Removal Area Site Reclamation)	\$ 2,530,489.10	5-7	2.589	\$ 6,551,436	
Phase V (Spillway Removal, Channel Stabilization and Area II and III Regrading/Revegetation, Site Cleanup)	\$ 2,137,136.46	7-8	1.651	\$ 3,528,412	
Phase VI (Ongoing Monitoring/Reporting) and Project Management	\$ 891,174.94	1-9	8.02	\$ 7,147,223	
Construction Management	\$ 936,293.57	2-9	7.02	\$ 6,572,781	
<b>Total Present Value of Alternative</b>					<b>\$ 95,109,667</b>